REMARKS

Claims 1 and 8 have been amended to correct punctuation.

Claims 1-14 are pending in the application.

By way of this response, Applicant has made a diligent effort to place the claims in condition for allowance. However, should there remain any outstanding issues that require adverse action, it is respectfully requested that the examiner telephone Eric J. Whitesell at (858)350-9257 so that such issues may be resolved as expeditiously as possible.

Response to the rejection under 35 U.S.C. § 102

Claims 1 and 8 stand rejected under 35 U.S.C. § 102(b), allegedly as being anticipated by Wang, U.S. Patent No. 5,859,964 (*Wang*). Applicant respectfully traverses the rejection as follows.

On page 4, the rejection alleges that *Wang* (C01 L55) discloses the claimed step of cleaning the data set of measurements. The rejection argues on page 5 that analyzing data in *Wang* (C01 L55) is equivalent to cleaning data as recited in Claims 1 and 8, presumably because principal component analysis is involved in both cases. However, analyzing data to detect a fault condition as described in *Wang* (C01 L55) is not equivalent to cleaning data. As explained in the specification (P09 L25-28), the claimed step of cleaning the data set means omitting abnormal samples from the data set to avoid introducing error. Clearly, data may be analyzed to detect a fault condition without necessarily omitting abnormal samples from the data set. Conversely, abnormal samples may be omitted from a data set without necessarily detecting a fault condition. Accordingly, analyzing data to detect a fault condition as described in *Wang* (C01 L55) and cleaning data as recited in Claims 1 and 8 are not even dependent on each other, therefore they cannot be equivalent. Because the rejection fails to establish that *Wang* (C01 L55) discloses the claimed step of cleaning the data set of measurements, the rejection of Claims 1 and 8 lacks sufficient support to substantiate a rejection under 35 U.S.C. § 102(b).

Further, *Wang* (C01 L55) cited by the rejection and the abstract explain that an

abnormality in the data is found by comparing the data set with model reference data to detect a fault condition. Accordingly, *Wang* (C01 L55) teaches that abnormal data is necessary to detect a fault condition, which teaches away from removing abnormal data from the data set. Because *Wang* (C01 L55) teaches that abnormal data is necessary to detect a fault condition, removing abnormal data would render *Wang* unsuitable for its intended purpose. Accordingly, removing abnormal data from the data set is not taught or suggested in *Wang* as alleged by the rejection. Because the abnormal data is not removed from the data set in *Wang* (C01 L55) as alleged by the rejection, the allegation that *Wang* (C01 L55) discloses cleaning data as recited in Claims 1 and 8 is false. Because the rejection fails to establish that *Wang* (C01 L55) discloses the claimed step of cleaning the data set of measurements, the rejection of Claims 1 and 8 lacks sufficient support to substantiate a rejection under 35 U.S.C. § 102(b).

The rejection further alleges on page 4 that *Wang* (C14 L40) discloses the claimed step of generating a principal component analysis basis from the cleaned data set. Because *Wang* does not disclose the claimed step of cleaning the data set as explained above, *Wang* does not disclose the claimed step of generating a principal component analysis basis from the cleaned data set. Even if *Wang* did disclose cleaning the data set, *Wang* (C14 L40) merely "contemplates" principal component analysis to build models from normal processes to detect deviations in a current process. Accordingly, *Wang* (C14 L40) does not disclose generating a principal component analysis basis from a cleaned data set as alleged by the rejection. Because the rejection fails to establish that *Wang* discloses the claimed step of generating a principal component analysis basis from the claimed cleaned data set, the rejection of Claims 1 and 8 lacks sufficient support to substantiate a rejection under 35 U.S.C. § 102(b).

The rejection further alleges on page 4 that *Wang* (C14 L13-14; F3B:PCAmodel, fault detector, alarm file, lot report) discloses the claimed step of removing a component from the principal component analysis basis when the calculated percentages of variance indicate that the component is a minor component. However, *Wang* (C14 L13-14) mentions reduction of a data set, not removing a component from the principal component analysis basis. Further, the rejection fails to establish any relevance of *Wang* (F3B:PCAmodel, fault detector, alarm file, lot

report) to the claimed step of removing a component from the principal component analysis basis. Accordingly, the rejection fails to establish that *Wang* discloses the claimed step of removing a component from the principal component analysis basis when the calculated percentages of variance indicate that the component is a minor component. Because the rejection fails to establish that that *Wang* discloses the claimed step of removing a component from the principal component analysis basis when the calculated percentages of variance indicate that the component is a minor component, the rejection of Claims 1 and 8 lacks sufficient support to substantiate a rejection under 35 U.S.C. § 102(b).

The rejection further alleges on page 4 that *Wang* (C14 L17; Abstract) discloses the claimed step of generating as output the estimated independent component analysis model excluding the minor component. However, *Wang* (C14 L17) discloses modeling a linear relationship of variables from a process, not the claimed step of generating as output the estimated independent component analysis model excluding the minor component as alleged by the rejection. The rejection argues that generating the claimed estimated independent component analysis model excluding the minor component is inherent in detecting a fault as disclosed in *Wang*. However, the rejection fails to provide support for the allegation (EN) that detecting a fault requires eliminating statistically uncorrelated variables, and there is no reasoning presented to support the rejection that would lead one to arrive at such a conclusion. Accordingly, the rejection fails to establish that generating the claimed estimated independent component analysis model excluding the minor component is inherent in *Wang*. Because the rejection fails to establish that generating the claimed estimated independent component analysis model excluding the minor component is inherent in *Wang*, the rejection of Claims 1 and 8 lacks sufficient support to substantiate a rejection under 35 U.S.C. § 102(b).

The rejection further alleges on pages 5-6 that *Wang* discloses identifying a corresponding physical mechanism, for example, a "signal health value", from the estimated independent component analysis model as recited in Claims 1 and 8. However, *Wang* (C14 L1-4) defines a signal health value as a difference between a prediction and a current sample. In contrast to *Wang*, the claimed physical mechanism is described in the specification (P24 L9 -

P25 L2) as attributes of a manufacturing process, for example, a lateral diffusion mechanism, channel implant characteristics, and implant variation, none of which include the prediction required by *Wang*. Further, a value is not a mechanism, nor does the signal health value in *Wang* identify a corresponding physical mechanism. Clearly, the health signal value in *Wang* may not reasonably be considered equivalent to the claimed physical mechanism. Because the rejection fails to establish that *Wang* discloses the claimed step of identifying a corresponding physical mechanism from the estimated independent component analysis model, the rejection of Claims 1 and 8 lacks sufficient support to substantiate a rejection under 35 U.S.C. § 102(b).

Response to the rejection under 35 U.S.C. § 103

Claims 2, 3, 9, and 10 stand rejected under 35 U.S.C. § 103(a), allegedly as being obvious over *Wang* in view of Agarwal, U.S. Patent 7,006,205 B2 (*Agarwal*) and Heavlin, U.S. Patent 6,389,366 (*Heavlin*). Applicant respectfully traverses the rejection for the reasons explained above and further as follows.

Regarding Claims 2 and 9, the rejection alleges on page 7 that *Agarwal* (C03 L42-50) teaches or suggests the claimed calculated percentages of variance indicating that a component is a minor component when a percentage of variance for each of the plurality of parameters explained by the component is less than a minimum percentage of variance for a single parameter. However, the general description of principal component analysis (PCA) in *Agarwal* (C03 L42-50) merely states that most of the variability in the data is accounted for by the first principal components. There is no teaching or suggestion that would lead one to calculate percentages of variance indicating that a component is a minor component when a percentage of variance for each of the plurality of parameters explained by the component is less than a minimum percentage of variance for a single parameter. Accordingly, the modification of *Wang* by *Agarwal* proposed by the rejection fails to arrive at the claimed invention. Because the modification of *Wang* by *Agarwal* proposed by the rejection fails to arrive at the claimed invention, the rejection of Claims 2 and 9 lacks sufficient support to substantiate a rejection under 35 U.S.C. § 103.

Regarding the rejection of Claims 3 and 10, the rejection alleges that *Agarwal* (C09 L42-50) teaches the claimed average percentage of variance for the plurality of parameters explained by the component is less than a minimum average percentage of variance. However, *Agarwal* (C09 L42-50) teaches an absolute level of variance (1×10^{-2}) and does not distinguish between the claimed percentage of variance for each of the plurality of parameters explained by the component and the claimed average percentage of variance for the plurality of parameters explained by the component. Accordingly, the modification of *Wang* by *Agarwal* proposed by the rejection fails to arrive at the claimed invention. Because the modification of *Wang* by *Agarwal* proposed by the rejection fails to arrive at the claimed invention, the rejection of Claims 3 and 10 lacks sufficient support to substantiate a rejection under 35 U.S.C. § 103.

Regarding Claims 4 and 11, the rejection alleges on page 8 that *Heavlin* (C02 L67) discloses the claimed rotation angles of the estimated independent component analysis model and that it would be obvious to modify *Wang* with the rotation angles in *Heavlin* to arrive at the claimed invention. As defined in the specification on P16 L24-26, the claimed rotation angles are displacement angles from the base model for each new independent component analysis model. In contrast to the claimed rotation angles, the rotation angle in *Heavlin* (C02 L67 – C03 L05) refers to the rotation angle of a wafer to match the orientation of another wafer, which is clearly not equivalent to the claimed rotation angle. The rejection argues on page 9 that the rotation angle in *Heavlin* reduces to a rotation of a coordinate system and that the claimed rotation angle also reduces to a rotation of a coordinate system. The rejection concludes that because both the rotation angle in *Heavlin* and the claimed rotation angle reduce to a rotation of a coordinate system, they may be considered to be equivalent. The problem with the argument presented to support the rejection is that the coordinate system for a wafer and the coordinate system for an estimated independent component analysis model are clearly not equivalent. Because the coordinate systems are not equivalent, a rotation of the wafer angle as disclosed in *Heavlin* is not equivalent to the claimed rotation angles of the estimated independent component

analysis model. Because the rotation of the wafer angle as disclosed in *Heavlin* is not equivalent to the claimed rotation angles of the estimated independent component analysis model as recited in Claims 4 and 11, the modification of *Wang* by *Heavlin* proposed by the rejection fails to arrive at the claimed invention. Because the modification of *Wang* by *Heavlin* proposed by the rejection fails to arrive at the claimed invention, the rejection of Claims 4 and 11 lacks sufficient support to substantiate a rejection under 35 U.S.C. § 103.

Regarding the rejection of Claims 5-7 and 12-14, the rejection alleges on pages 9-10 that it would be obvious to modify *Wang* by the examiner's suggestion to arrive at the claimed invention because labeling components would help identify and isolate the corresponding processes. However, the rejection fails to show where the claimed step of labeling components of the estimated independent component analysis model may be found in the cited prior art. Further, the rejection fails to show where the cited motivation of identifying and isolating the corresponding processes may be found in the cited prior art for making the proposed modification. In fact, the phrase "isolating sources of variance in parametric data to facilitate identifying the physical mechanisms underlying the sources of variance in the manufacture of integrated circuits" from the summary on P2 L10-13 of the specification suggest that the motivation cited by the rejection may rely on the benefit of hindsight gained from the subject application and not from the cited prior art. Still further, *Wang* is directed to fault detection, not to isolating processes that correspond to components of the estimated independent component analysis model. Accordingly, the rejection fails to show how *Wang* would benefit with respect to its intended purpose by the proposed modification. Because the rejection fails to show where the claimed step of labeling components of the estimated independent component analysis model may be found in the cited prior art, and because the rejection fails to show where motivation may be found in the cited prior art for making the proposed modification, and because the rejection fails to show motivation found in the prior art for making the proposed modification, and because the rejection fails to show how *Wang* would benefit with respect to its intended purpose by the proposed modification, the rejection of Claims 5-7 and 12-14 lacks

sufficient support to substantiate a rejection under 35 U.S.C. § 103.

In view of the above, Applicant respectfully requests favorable examination and reconsideration of Claims 1-14.

No additional fee is believed due for this amendment.

Respectfully submitted,

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